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Amendments to the Abstract:

In one embodiment, the present invention is a low-power, and high performance receiver including an IF demodulator for high data rate, frequency modulated systems, such as Bluetooth. The IF demodulator is implemented in analog domain for simplicity and lower power consumption and operates at an IF frequency. ~~In one aspect, the present invention is an~~ An IF demodulator ~~comprising~~^{comprises}: a first IF differentiator for differentiating an I signal; a second IF differentiator for differentiating a Q signal; a cross-coupled multiplier for multiplying the differentiated I signal with the ~~I-Q~~ signal and multiplying the differentiated Q signal with the ~~Q-I~~ signal to extract frequency information from the I signal and the Q signal; and a slicer for converting the frequency information to digital data.